Volunteer Lake Assessment Program Individual Lake Reports

MASCOMA LAKE, ENFIELD, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	97,918	**Max. Depth (m):**	20.1	**Flushing Rate (yr^{1})**	4.6
Surface Area (Ac.):	1115	**Mean Depth (m):**	8.7	**P Retention Coef:**	0.39
Shore Length (m):	15,100	**Volume (m^{3}):**	39,458,000	**Elevation (ft):**	751

TROPHIC CLASSIFICATION

Year	Trophic class
2000	MESOTROPHIC
2008	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

Eurasian Milfoil

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

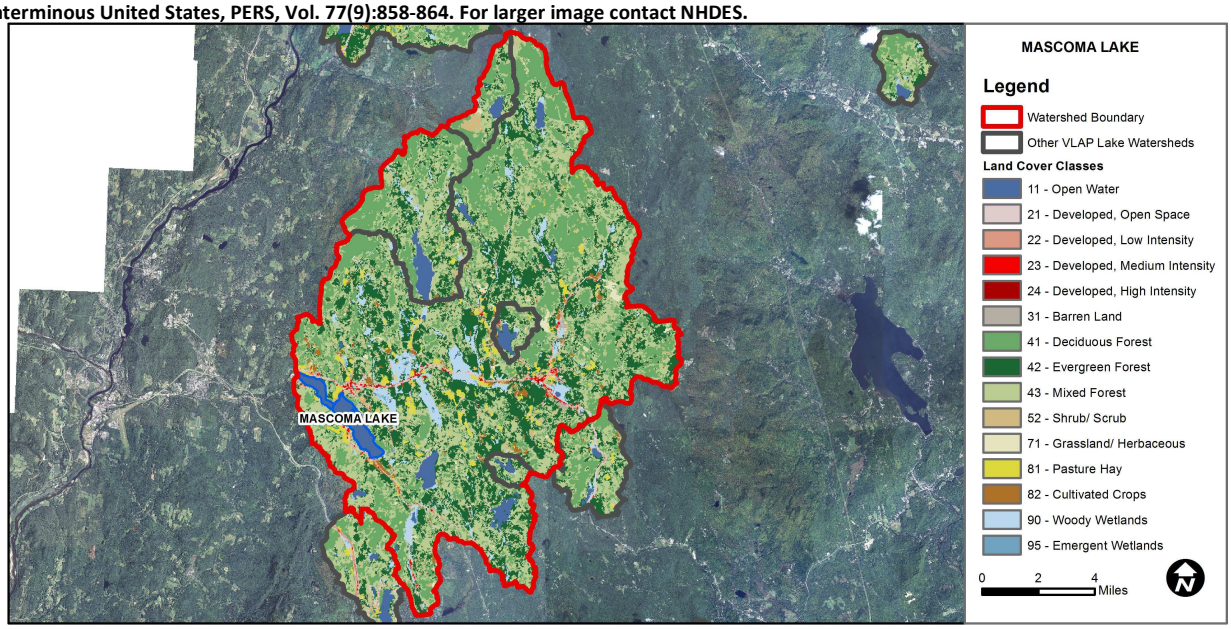
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Good	At least 10 samples with 1 sample but < 10% of samples exceeding criteria.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

MASCOMA LAKE - DARTMOUTH COLLEGE BEACH	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
MASCOMA LAKE - DARTMOUTH COLLEGE BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
MASCOMA LAKE - CRESCENT BEACH	E. coli	No Data	No Data for this parameter.
MASCOMA LAKE - SHAKOMA BEACH	E. coli	Cautionary	One exceedance of single sample criteria but not enough data to calcuate geometric mean. More data needed.
MASCOMA LAKE - SHAKOMA BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

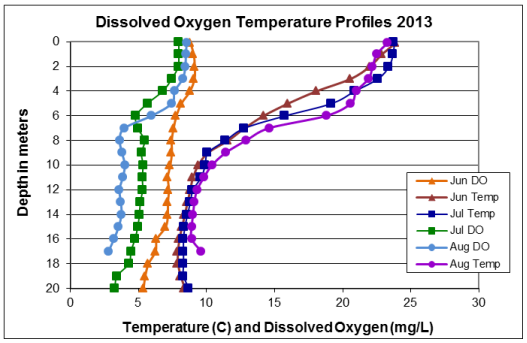


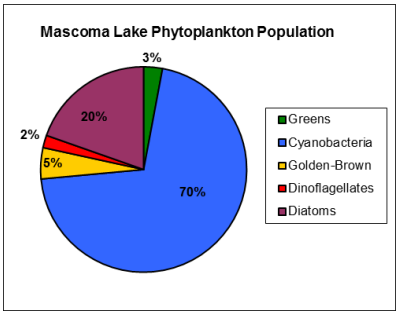
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	3.57	Barren Land	0.2	Grassland/Herbaceous	0.77
Developed-Open Space	2.03	Deciduous Forest	24.1	Pasture Hay	1.91
Developed-Low Intensity	0.73	Evergreen Forest	25.43	Cultivated Crops	0.85
Developed-Medium Intensity	0.3	Mixed Forest	33.58	Woody Wetlands	4.2
Developed-High Intensity	0.04	Shrub-Scrub	2.03	Emergent Wetlands	0.18

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
MASCOMA LAKE, ENFIELD, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphic)*

- **CHLOROPHYLL-A:** Chlorophyll levels were low in June, July and August; however cyanobacteria scums appeared in late August. Historical trend analysis indicates stable chlorophyll with low variability between years.
- **CONDUCTIVITY/CHLORIDE:** Conductivity and chloride continue to be elevated in upstream branches of LaSalette BK. and in Shaker and Browns Bks. Deep spot conductivity was slightly greater than the state median. Historical trend analysis indicates stable epilimnetic conductivity with low variability between years.
- **E. COLI:** E. coli levels were slightly greater in June following significant storm events; however levels did not exceed the state standard for surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels increased from 2012 potentially due to the above average rainfall in early summer. Metalimnetic phosphorus levels were low and hypolimnetic phosphorus levels were average. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Phosphorus levels in Browns Bk. were elevated in June and July. Significant storm events in June and July likely contributed to elevated phosphorus.
- **TRANSPARENCY:** Average transparency was lower in 2013, particularly in July. Transparency measured with the viewscope was slightly better than without and decreased gradually from June to August. Historical trend analysis indicates relatively stable transparency with moderate variability between years.
- **TURBIDITY:** Tributary turbidity levels were within normal ranges for those stations. Metalimnetic turbidity was slightly elevated in July and August indicating a layer of algae may have been present at that depth.
- **PH:** Metalimnetic and hypolimnetic pH levels were lower than desirable.
- **DISSOLVED OXYGEN:** Dissolved oxygen levels were sufficient throughout the water column in June. By August, dissolved oxygen levels decreased through the hypolimnion and into metalimnion. This is not unusual as these layers do not get re-oxygenated during the summer months.
- **RECOMMENDED ACTIONS:** Continue chloride investigations at LaSalette Bk. as well as Shaker and Browns Bk. to identify potential sources including road, driveway, sidewalk salting, fertilizers, and water softener discharge. Browns Bk. also experienced elevated phosphorus levels following significant storm events. Identify potential sources and implement best management practices to reduce phosphorus and chloride loading. Above average rainfall throughout the summer likely contributed to the higher epilimnetic phosphorus levels. Educate homeowners on ways to reduce stormwater runoff from their properties utilizing DES' "NH Homeowner's Guide to Stormwater Management". Keep up the great work!





NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Table 1. 2013 Average Water Quality Data for MASCOMA LAKE

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Browns Brook			42	216.3		32			1.03	6.41
Dam Outlet			8	64.7		8			0.70	7.06
Knox River Inlet			19	131.6	52	10			0.98	6.86
LaSalette #3			100	448.0						
LaSalette #7			110	470.0						
LaSalette Brook			3	74.4		9			0.47	6.60
Mascoma River Inlet			7	72.8	112	16			2.78	6.90
Shaker Brook			83	260.6		8			0.52	6.80
Station 1 Epilimnion	12.1	2.09	8	62.6		11	3.03	3.69	0.80	6.96
Station 1 Metalimnion				57.9		8			1.36	6.41
Station 1 Hypolimnion				58.0		14			1.84	6.29

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data highly variable	Chlorophyll-a	Stable	Trend not significant; data show low variability.
Conductivity	Stable	Trend not significant; data show low variability.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.